Clinical Oral Medicine

Leprosy: dental and periodontal status of the anterior maxilla in 76 patients

JM Núñez-Martí¹, JV Bagán², C Scully³, M Peñarrocha⁴

¹Hospital San Francisco de Borja de Fontilles, Alicante, Spain; ²Valencia University, Valencia University General Hospital, Valencia, Spain; ³International Centres for Excellence in Dentistry and Eastman Dental Institute for Oral Health Care Sciences, University College London, London, UK; ⁴Professor of Oral Surgery, Valencia University, Valencia, Spain

OBJECTIVE: To evaluate the presence of oral disease, as assessed by dental and periodontal indices, in the anterior maxilla of a group of 76 patients with leprosy, compared with a group of matched control subjects.

MATERIALS AND METHODS: The study included 76 patients with leprosy (age range 40–82 years; 39 males), resident in the sanatorium of San Francisco de Borja de Fontilles (Alicante, Spain). Clinical examination was carried out to evaluate the decayed missing and filled index, and the periodontal status in the anterior maxilla, using the Löe–Silness dental plaque index, mean periodontal probing depth and the average periodontal attachment loss.

RESULTS: In the leprosy patients, a large proportion of maxillary incisors and canines were missing. The mean plaque index in leprosy was 2.35 ± 0.7 , with a probing depth of 2.96 ± 0.8 , and an average attachment loss of 4.18 ± 1.3 , indices all statistically greater than in controls. There were no differences detected in the oral indices measured according to the presence or absence of facial destruction or the type of leprosy.

CONCLUSIONS: Patients with leprosy show a tendency to poor dental and periodontal health, unrelated to the presence of facial destruction or the type of leprosy. *Oral Diseases* (2004) **10**, 19–21

Keywords: leprosy; dental alteracions; periodontal disease; lepromatous; tuberculoid

Introduction

Leprosy (Hansen's disease) is a chronic granulomatous disorder caused by *Mycobacterium leprae* (ML), an acid-fast bacillus and obligate intracellular mycobacterium,

first identified in 1873 (Hansen, 1874). The disease is fortunately of low infectivity (Ridley and Jopling, 1966; Clements and Scollard, 1996).

Leprosy manifests in a spectrum of clinical types with two extreme polar forms named lepra tuberculoid (LT) and lepra lepromatous (LL) and a third one named borderline (Ridley and Jopling, 1966; Clements and Scollard, 1996). Oral lesions, which are usually seen in the lepromatous form are rare (Michmann and Sagher, 1957; Möller-Christensen, 1974) but have been reviewed elsewhere (Waaler, 1953).

The anterior face is particularly affected in leprosy with severe destruction in some patients, often involving the maxilla. However, the dental and periodontal status of patients with leprosy has not been examined in any great detail though the decayed missing and filled (DMF) index has been recorded as somewhat raised (Möller-Christensen, Bakke and Melsom, 1952; Waaler, 1952; Michmann and Sagher, 1957; Möller-Christensen, 1974).

Therefore, we conducted a study to analyse the dental and periodontal status in the anterior maxilla in a group of leprotic patients in Spain, compared with matched controls.

Materials and methods

The study group, conducted in 2002, comprised 76 patients with leprosy, resident in the sanatorium of San Francisco de Borja de Fontilles (Alicante, Spain). All had been started on combination chemotherapy (rif-ampicin, dapsone and clofazimine for multibacillary presentations; rifampicin and dapsone for paucibacillary forms), and all had completed therapy.

Currently, 60.5% of the patients were not undergoing treatment for the disease, 31.6% were receiving Sulfone treatment and 7.9% were receiving multi-therapy on showing signs of relapse.

The age range of the study group was 40-82 years (mean, 65 ± 1.07); there were 39 males (51.3%). Most of the patients (62; 81.6%) had lepromatous leprosy,

Correspondence: Dr Juan Manuel Núñez-Martí, C/San Francisco de Borja, 1 46700 Gandía (Valencia), Spain. Tel and Fax: 34 96 2865157, E-mail: lolijuanma@hotmail.com

Received 13 June 2003; revised 31 August 2003; accepted 02 October 2003

eight (10.5%) had the borderline form, and six (7.9%) had tuberculoid leprosy. About one-third of the group (23; 30.3%) had mid-facial destruction with the typical leprotic facies, but none had active clinical oral lesions of leprosy.

The control group consisted of 76 healthy and no institutionalized people, who took no medications and were matched for age and sex.

Both patients and controls were subjected to an oral examination, consisting of the DMF index (Cuenca, 1991), followed by an evaluation of the periodontal status of the maxillary incisor and canine region, based on the Löe–Silness dental plaque index (Silness and Löe, 1964), mean periodontal pocket probing depth and average periodontal attachment loss (Ramfjord, 1967). The different indices were also examined according to the presence or absence of facial destruction and the different types of leprosy (lepromatous, tuberculoid or borderline).

The results were analysed by means of SSPS, making a descriptive and analytical study using the Student's *t*-test and ANOVA test, to determine differences between groups, considering *P*-values less or equal to 0.05 as significant.

Results

The mean DMF index in leprotic patients of 19.06 ± 6.5 was not significantly greater than in controls (Table 1). However, there were statistically significant differences between patients and controls regarding all other oral parameters measured.

In the leprotic group, a large proportion of patients had missing maxillary incisors and canines (2.91 per patient) or carious teeth (6.49 per patient) than did controls. In leprosy, the mean plaque index was 2.35 ± 0.7 ; the probing depth 2.96 ± 0.8 , and the average periodontal attachment loss was 4.18 ± 1.3 , all significantly greater than controls.

Analysing the differences in indices regarding the presence or absence of facial destruction (Table 2), we found no differences. We found no significant differences in the oral indices between patients with the different forms of leprosy (Table 3).

Discussion

This study of 76 patients with leprosy showed that a large proportion of maxillary incisors and canines were missing. The mean plaque index, probing depth and average attachment loss were all statistically greater in leprosy patients than in controls. There were no differences detected in the indexes accordingly to the presence or absence of facial destruction or the type of leprosy.

In the present study, we observed greater plaque indices and probing depths in most leprotic patients compared with the control group, and this could well explain the gingivitis and recession, probably a consequence of poor oral hygiene because of finger mutilation, masticatory defects, gingival sensitivity problems and altered tongue and masticatory muscles. We found no differences between the various forms of leprosy, but the numbers studied were small.

	Leprosy $n = 76$ $(mean + sd)$	Control $n = 76$ $(mean + sd)$	t	P-value
	(mean ± s.a.)	(mean ± 3.a.)	ι	1 value
DMF index	19.06 ± 0.84	17.25 ± 5.15	1.81	0.07
Carious teeth	$6.49~\pm~0.61$	$4.60~\pm~2.90$	2.77	0.06
Missing teeth	13.55 ± 9.65	10.81 ± 5.53	2.14	0.03*
Filled teeth	$1.04~\pm~2.02$	1.85 ± 2.44	-2.21	0.02*
Missing maxillary incisors and canines (anterior maxilla)	$2.90~\pm~2.62$	$1.55~\pm~2.01$	3.56	< 0.01*
Plaque index (anterior maxilla)	$2.35~\pm~0.77$	1.75 ± 0.63	4.68	< 0.01*
Probing depth (anterior maxilla)	$2.96~\pm~0.82$	$2.23~\pm~0.57$	5.65	< 0.01*
Attachment loss (anterior maxilla)	$4.18~\pm~1.26$	$3.11~\pm~0.82$	5.59	< 0.01*

Table 1 Dental and periodontal health inleprotic and control groups

 Table 2 Comparison of dental and periodontal health in leprotic patients with or without

any facial destruction

*Statistically significant differences.

	Without facial destruction n = 53 (mean \pm s.d.)	With facial destruction n = 23 (mean ± s.d.)	P-value
Carious teeth	6.82 ± 5.32	$6.34~\pm~5.08$	> 0.05
Filled teeth	2.00 ± 0.41	2.05 ± 0.29	> 0.05
Missing teeth	14.43 ± 1.85	13.16 ± 1.37	> 0.05
DMF index	21.26 ± 4.70	18.07 ± 7.07	> 0.05
Missing maxillary incisors and canines (anterior maxilla)	$3.04~\pm~0.52$	$2.84~\pm~0.37$	> 0.05
Probing depth (anterior maxilla)	3.00 ± 0.81	2.94 ± 0.83	> 0.05
Attachment loss (anterior maxilla)	$4.37~\pm~0.31$	$4.10~\pm~0.21$	> 0.05

*Statistically significant differences.

20

Oral disease in leprosy patients Núñez-Martí *et al*

 Table 3 Dental and periodontal health in different types of leprosy

	Lepromatous n = 62 (mean \pm s.d.)	Borderline n = 8 (mean \pm s.d.)	Tuberculoid $n = 6$ (mean ± s.d.)	P-value
Carious teeth	6.15 ± 5.08	8.50 ± 5.52	7.16 ± 4.87	> 0.05
Filled teeth	$0.91~\pm~1.85$	1.12 ± 1.24	$2.16~\pm~3.92$	> 0.05
Missing teeth	13.75 ± 9.65	9.75 ± 8.77	16.50 ± 10.89	> 0.05
DMF index	18.55 ± 6.08	219.37 ± 9.53	24.75 ± 2.87	> 0.05
Missing maxillary incisors and canines (anterior maxilla)	$2.96~\pm~2.63$	$2.87~\pm~2.69$	$2.33~\pm~2.94$	> 0.05
Plaque index (anterior maxilla)	$2.34~\pm~0.76$	$2.16~\pm~0.98$	2.75 ± 0.50	> 0.05
Probing depth (anterior maxilla)	$2.97~\pm~0.82$	$3.00~\pm~0.89$	$2.75~\pm~0.95$	> 0.05
Attachment loss (anterior maxilla)	$4.14~\pm~1.25$	$4.50~\pm~1.51$	$4.12~\pm~1.18$	> 0.05

*Statistically significant differences.

Only two studies of the DMF index in leprosy patients have been reported: one in Fontilles (Alicante, Spain) (Ceballos, Urquía and Rodríguez-Archilla, 1993), yielding a DMF 16.2, and another in Senegal (Diallo, Borugeois and Condert, 1992), with a DMF index of 15.8. The DMF index recorded in the present study was greater, at 19.06, a value not attributable to the number of conservative treatments involved (1.04 per patient on average) but rather to the number of missing teeth (13.55 per patient). Leprotic patients often had missing maxillary anterior teeth (2.91 per patient) or carious teeth (6.49 patient).

It has been reported of gingival recession in 60% of patients (Reichart, 1976) and described a characteristic triad of lesions in the mid-face, called *facies leprosa*, including loss of the anterior nasal spine, alveolar inflammatory changes, and atrophy and recession of the maxillary alveolar process (Möller-Christensen *et al*, 1952). Maxillary alterations were found in 16% (Möller-Christensen, 1974). Chronic gingival inflammation and periodontal attachment loss has been recorded around the central incisors (Scollard and Skinsnes, 1999). Though there has been no clear explication for these osseous changes in leprosy: reactive bone changes, the effects of chronic inflammation and a neutrophil infiltrate, and reduced temperature may be implicated (Brand, 1959).

References

- Brand PW (1959). Temperature variation and leprosy deformity. Int J Lepr 27: 1–7.
- Ceballos A, Urquía M, Rodríguez-Archilla A (1993). Estado bucal de una población hanseniana en España. *Rev Lepr Fontilles* **19:** 167–177.

- Clements BR, Scollard DM (1996). Leprosy. In: Mandell GL, Fekety R, eds. *Atlas of infectious diseases*. Vol. 8. Current Medicine: Philadelphia, pp. 9.1–9.28.
- Cuenca E (1991). La identificación de problemas en odontología comunitaria. En: Cuenca E, Manan C, Serra LI. *Manual de Odontología preventiva y comunitaria*. Edición Masson: Barcelona, pp. 226–242.
- Diallo B, Borugeois D, Condert JL (1992). Evaluation de l'erat orofacial et dentaive d'une population hansénienne traitée par polychimiothérapie an Sénégal. Acta Leprol 8: 11–15.
- Hansen GA (1874). Spedalskhedens arsager. Norsk Mag Laegevidensk 4: 36–79.
- Michmann J, Sagher F (1957). Changes in the anterior nasal spine and the alveolar process of the maxilla bone in leprosy. *Int J Lepr* 25: 217–222.
- Möller-Christensen V (1974). Changes in the anterior nasal spine and the alveolar process of the maxillae in leprosy: a clinical examination. *Int J Lepr* **42**: 431–435.
- Möller-Christensen V, Bakke SN, Melsom RS (1952). Changes in the anterior nasal spine of the alveolar process of the maxillary bone in leprosy. *Int J Lepr* **20**: 335–340.
- Ramfjord SP (1967). The Periodontal Index (PDI). J Periodontol 38: 602–610.
- Reichart P (1976). Facial and oral manifestation in leprosy. Oral Surg **41**: 385–399.
- Ridley DS, Jopling WH (1966). Classification of leprosy according to immunity: a five-group system. Int J Lepr 34: 255–273.
- Scollard DM, Skinsnes OK (1999). Oropharyngeal leprosy in art, history, and medicine. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 87: 463–470.
- Silness Pf, Löe H (1964). Periodontal disease in pregnancy. *Acta Odontol Scand* 22: 121–135.
- Waaler E (1952). Changes in the maxillary bone in leprosy. *Int J Lepr* **20**: 335–340.

Copyright of Oral Diseases is the property of Blackwell Publishing Limited and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.

Copyright of Oral Diseases is the property of Wiley-Blackwell and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.